REMARKS

Status of Claims:

Claims 1-10 are present for examination.

Claim Rejection:

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yonemitsu (U.S. Patent Number 5,485,279), Matsushima (U.S. Patent Number 5,453,788), and Kim (U.S. Patent Number 6,104,753) in view of Suzuki (U.S. Patent Number 5,872,600).

With respect to claims 1-10, the rejection is respectfully traversed.

Independent claim 1 recites a method for displaying frames of a dynamic image using single field data from an interlaced encoded image data having a two-field structure, comprising the steps of:

> "performing inverse quantization of the interlaced encoded image data to obtain DCT (Discrete Cosine Transform) coefficients of each of a plurality of field blocks that comprise a frame;
>
> to half the size of the DCT coefficients and for each frame, **selecting only one, but not both, of two fields that form the frame and discarding the non-selected field**, each selected field consisting of selected field blocks;
>
> doubling the size of the DCT coefficients of each selected field block in **each selected field** by adding high frequency components in order to obtain compensated DCT coefficients having a data size corresponding to a frame block;
>
> performing inverse DCT of the compensated DCT coefficients to obtain image data corresponding to said frame block; and
>
> displaying the image data." (Emphasis Added).

A method for displaying frames of a dynamic image using **single field data** from an interlaced encoded image data having a two-field structure including the above-quoted features has at least the advantages that: (i) **only one, but not both, of two fields** that form a frame is **selected**; (ii) the **non-selected field** is **discarded**; (iii) a size of DCT coefficients of

each selected field block in **each selected field** is doubled by adding high frequency components to obtain compensated DCT coefficients; and (iv) inverse DCT of the compensated DCT coefficients is performed to obtain image data. (Specification; page 2, line 23 to page 3, line 8; page 6, line 25 to page 7, line 12; page 7, lines 20-23; page 8, line 6 to page 9, line 4).

Such a method addresses the problem that there may be a time lag, such as 1/60 second, between the two fields in each frame, and if the motion of the images is large and both fields are used to form scanning lines for the images, then the quality of the images will be lowered and the images may become indistinct. By selecting **only one, but not both, of the two fields** to form images, there is no time lag between scanning lines, so the images reproduced can be clear even if the motion of the images is large or fast. (Specification; page 1, line 14 to page 2, line 15; page 3, lines 12-16; page 7, line 23 to page 8, line 5; page 8, line 22 to page 9, line 4).

Neither Yonemitsu, Matsushima, Kim, nor Suzuki, alone or in combination, disclose or suggest a method including the above-quoted features with steps of: (i) to half the size of DCT coefficients and for each frame, **selecting only one, but not both, of two fields that form the frame and discarding the non-selected field**; and (ii) doubling the size of the DCT coefficients of each selected field block in **each selected field** by adding high frequency components in order to obtain compensated DCT coefficients having a data size corresponding to a frame block.

The Examiner recognizes that, "Yonemitsu and Matsushima do not specifically disclose 'to half the size of the DCT coefficients and for each frame, selecting only one, but not both, of two fields that form the frame, each selected field consisting of selected field blocks' ". The Examiner then points to Kim as teaching, "the decimation of the frame to half the size of the DCT coefficients and for each frame, **selecting only one, but not both, of two fields** that form the frame, each selected field consisting of selected field blocks". (Emphasis Added). The Examiner recognizes that, "Yonemitsu, Matsushima and Kim do not specifically disclose the limitation of **discarding** the **non-selected field**." (Emphasis Added). The Examiner then points to Suzuki as teaching "the limitation of **discarding** of the **non-**

selected field (col. 5, ln. 62 to col. 6, ln. 9 and col. 6, ln. 26-34; note deletion or discarding of **unneeded fields** from the preset or preselected fields)." (Emphasis Added).

However, while Suzuki allows for the discarding of **unneeded** fields, such discarding cannot be applied to any of the fields in Kim, because Kim **needs** both the even field **and** the odd field to decode an interlaced scanned image. (Suzuki; column 2, line 64 to column 3, line 35; column 5, line 61 to column 6, line 34) (Kim; FIG. 7; column 7, lines 10-15).

Kim does not disclose or suggest to half the size of the DCT coefficients and for each frame, **selecting only one, but not both, of two fields that form the frame**. Instead, Kim uses **both fields** of each frame to decode an interlaced scanned image. The main idea for the processing of interlaced scanned images in the method of Kim is illustrated in FIG. 7 of Kim. In the method of Kim, there are two options for processing interlaced scanned images, because the interlaced scanned images: (i) may already be separated into even and odd fields as illustrated in FIG. 8b of Kim; or (ii) may not yet be separated into even and odd fields as illustrated in FIG. 8a of Kim, where the even and odd fields are mixed. Thus, as illustrated in the flowchart of FIG. 12 of Kim, there are two ways for performing decimation for interlaced scanned images in Kim, which are: (i) **even line decimation**, which removes data on even **lines** from **both the even and odd fields**, and corresponds to step S45 in FIG. 12 and is illustrated in FIG. 10 of Kim; and (ii) first classifying the even and odd fields into even and odd fields, and then removing data on **even line** positions from **each of the even and odd fields**, which corresponds to step S43 in FIG. 12 and is illustrated in FIG. 11 of Kim. (Kim; column 7, lines 10-25; column 8, line 38 to column 9, line 53).

In the discussion that follows, FIG. 7 of Kim will first be examined to explain the overall concept of the method of Kim, and then the flowchart in FIG. 12 of Kim will be examined in conjunction with FIGs. 10 and 11 of Kim to show that Kim neither discloses nor suggests to half the size of the DCT coefficients and for each frame, **selecting only one, but not both, of two fields that form the frame**.

The overall concept for processing interlaced scanned images in the method of Kim is illustrated in FIG. 7 of Kim. In column 7, lines 11-15, Kim states the following:

> "for decoding an interlace scanned image, the **even field and the odd field** should be decimated independently. As shown in FIG. 7, decimated positions in this case correspond to **even line** positions for **each of the even field and the odd field**." (Emphasis Added).

As shown in FIG. 7 of Kim, in the method of Kim, **both** the **even field and the odd field** are used for decoding an interlaced scanned image. When performing decimation, Kim decimates even **line** positions from **each of the even field and the odd field**. Thus, Kim uses **both** the **even field and the odd field** for decoding an interlace scanned image. (Kim; FIG. 7; column 7, lines 10-15).

With reference to the flowchart of FIG. 12 of Kim, if an image is an interlace scanned image, then in step S40 progressive scanned frame is determined to be "no". (Kim; column 9, lines 4-6). Then, if either: (i) the picture structure is determined to be field in step S41; or (ii) the picture structure is determined to be frame in step S41, the DCT type is determined to be field in step S42, and the component index is determined to be a luminance signal in S44, then the even field and the odd field are already separated, and the method of Kim removes data on **even line** positions from **both** the **even field and the odd field** independently in step S45. (Kim; FIG. 12, steps S40, S41, S42, S44, S45; column 9, lines 17-21 and lines 30-37 and lines 43-48). FIG. 8B of Kim illustrates a case in which an interlace scanned image with a luminance signal is discrete cosine transformed with a field DCT method, and shows that the even field and the odd field are separated by the field DCT method. (Kim; column 7, lines 15-25).

In FIG. 8B, because the field DCT method results in a DCT type of field (step S42: field) and the component index is luminance (step S44: Y), **even line** decimation would be performed in step S45 on **each of** the separated **even and odd fields** from FIG. 8B. (Kim; FIG. 12). **Even line** decimation, such as that performed in step S45 of the flowchart of FIG. 12 of Kim, is illustrated in FIG. 10 of Kim for one field, and would be **repeated for each field**. (Kim; column 9, lines 21 and 37). Therefore, the decimation in step S45 of FIG. 12 of Kim is **even line** decimation for **both** of the **even field and the odd field** that have already been separated from each other. (Kim; column 9, lines 14-21 and lines 30-37 and lines 43-48). As a consequence, in step S45 of FIG. 12, Kim neither discloses nor suggests to half the

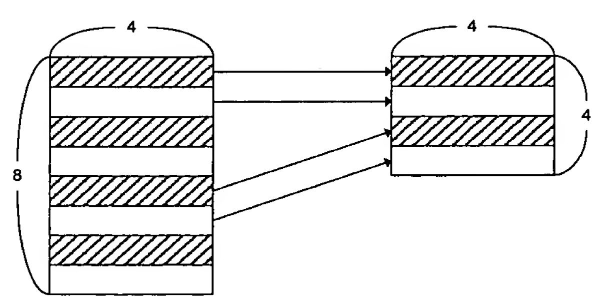
size of the DCT coefficients and for each frame, **selecting only one, but not both, of two fields that form the frame**.

Furthermore, in the flowchart of FIG. 12 of Kim, if either: (i) the DCT type is determined to be frame in step S42; or (ii) the component index is determined to be color in step S44, then the even and odd fields are determined to be mixed, and in step S43 the method of Kim **classifies** the even and odd fields and then removes data on **even line** positions from **each of** the **even and odd fields** after classification. (Kim; FIG. 12, steps S42, S43, S44; column 9, lines 22-29 and lines 37-43 and lines 48-53). FIG. 8A of Kim illustrates a case in which an interlace scanned image with a luminance signal is discrete cosine transformed with a frame DCT method, and shows that the even and odd fields remain mixed after the frame DCT method.

In FIG. 8A, because the frame DCT method results in a DCT type of frame (step S42: frame), the even and odd fields would be classified in step S43 and **even line** decimation would be performed on **each of** the **even and odd fields** after classification in step S43. (Kim; FIG. 12). Kim states that classifying even and odd fields and decimating **even lines** from **each of** the **even and odd fields**, such as that performed in step S43 of FIG. 12 of Kim, is illustrated in FIG. 11 of Kim. (Kim; column 9, lines 22-29 and lines 37-43 and lines 48-53). However, applicant believes that there are errors in FIG. 11 of Kim as compared with the description of FIG. 11 in the written detailed description portion of the Kim reference.

In particular, applicant believes that the correct illustration of FIG. 11 of the Kim reference should be:

FIG. 11
(Revised)



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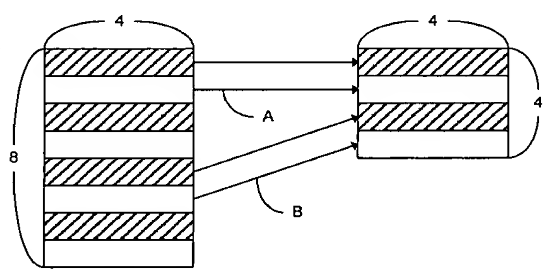
In order to explain the changes that are believed to be needed to FIG. 11 of Kim, the following version of FIG. 11 is provided with a table on the left hand side to aid in the discussion of the figure. Also, to aid in the discussion, two of the arrows in the figure are labeled "A" and "B" respectively.

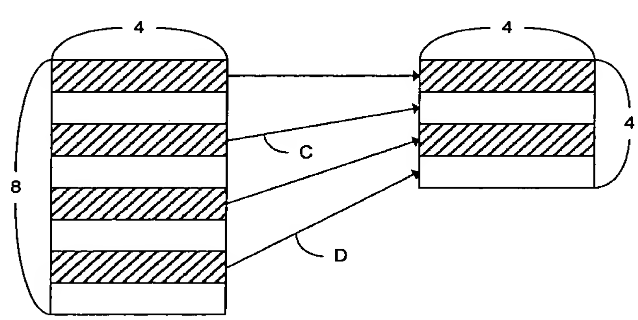
FIG. 11
(Revised with Table and Labeled Arrows)

Even Field	Odd Field	Even Line	Odd Line
x			x
	x		x
x		x	
	x	x	
x			x
	x		x
x		x	
	x	x	



In FIG. 11 of Kim, the even and odd fields have been classified, where shaded lines indicate lines that are classified as part of an even field and blank lines indicate lines that are classified as part of an odd field. Notice that in the revised FIG. 11 above: (i) the arrow labeled "A" goes from a line of an odd field (blank line) to a line of an odd field (blank line); and (ii) the arrow labeled "B" goes from a line of an odd field (blank line) to a line of an odd field (blank line). This is in contrast to the original FIG. 11 of Kim shown immediately below where: (i) the arrow labeled "C" goes from a line of an even field (shaded line) to a line of an odd field (blank line); and (ii) the arrow labeled "D" goes from a line of an even field (shaded line) to a line of an odd field (blank line).

FIG. 11
(Original with Labeled Arrows)



Having lines of an even field become lines of an odd field after decimation is inconsistent with the written detailed description in Kim, because the purpose of the decimation in Kim is to decimate **even lines** of each of **even and odd fields**, and not to cause lines of an even field to become lines of an odd field. In the revised FIG. 11 as shown above, the **even lines** of each of the **even and odd fields** are decimated as is consistent with the written detailed description portion of the Kim reference. (Kim; column 8, lines 45-47 and lines 50-52 and lines 54-56; column 9, lines 24-29 and lines 40-43 and lines 51-53).

The Examiner points to Kim, column 8, lines 43-57, which states:

> "Therefore, in a decimation, the adaptive vertical decimating part 32 removes data on **even line** positions, as shown in FIG. 10, or **data on pairs of even and odd fields** after dividing a picture **into even and odd fields** as shown in FIG. 11 depending on DCT types, picture structures, progressive frames and component indices. The decimation shown in FIG. 10 is used when no division into even and odd fields is required, and the decimation shown in FIG. 11 is used when the DCT coefficients is a mix of even and odd coefficients to require a classification. The method of decimation whether to decimate by removing the data on the **even lines**, as shown in FIG. 10, or to decimate by **removing pairs of even and odd fields** after division into even and odd fields in advance, is determined based on different decoded parameters as shown in FIG. 12." (Emphasis Added).

With reference to the revised FIG. 11 as shown above, it can be seen what Kim is referring to when Kim states that decimation is performed by "removing **pairs of even and odd fields** after division into even and odd fields". (Emphasis Added). In the revised FIG. 11, the even and odd fields are shown as being classified, where the lines of the even field are shaded, and the lines of the odd field are blank, so as to divide (i.e. classify) the even and odd fields. Then, the **even lines** of **each of** the **even and odd fields** are decimated. Because an even line of an even field and an even line of an odd field are positioned next to each other, when the even line of the even field and the even line of the odd field are removed, a "**pair**" of the even and odd fields is removed. Thus, the "pairs" of even and odd fields that are removed refer to the respective **adjacent even lines** of the **even and odd fields** that are removed. Support for this interpretation of FIG. 11 of Kim is found in the Kim reference at column 9, lines 24-29 and lines 37-43 and lines 48-53.

In summary, the even line decimation of step S45 of FIG. 12 of Kim that is illustrated in FIG. 10 of Kim, and the decimation after classifying even/odd fields of step S43 of FIG. 12 of Kim that is illustrated in (revised) FIG. 11 of Kim, **both** remove **even line** positions from **each of** an **even field and an odd field** as shown in FIG. 7 of Kim, where FIG. 7 provides an illustration of the main idea of the method of Kim. Thus, Kim **needs** both the even field and the odd field, and only removes **even lines** from each of the two fields. As a result, it would not be possible to **discard** either the even field or the odd field as **unneeded** in the system of Kim, because **both** the **even field and the odd field** are **needed** in the system of Kim to decode an interlaced scanned image.

Therefore, independent claim 1, as amended, is neither disclosed nor suggested by the Yonemitsu, Matsushima, Kim, and Suzuki references and, hence, is believed to be allowable. The Patent Office has not made out a *prima facie* case of obviousness under 35 U.S.C. 103.

Independent claim 3 recites a method for displaying frames of a dynamic image with features similar to features of a method for displaying frames of a dynamic image of independent claim 1. Therefore, independent claim 3 is believed to be allowable for at least the same reasons that independent claim 1 is believed to be allowable.

Independent claim 5 recites an apparatus for displaying frames of a dynamic image with features similar to features of a method for displaying frames of a dynamic image of independent claim 1. Therefore, independent claim 5 is believed to be allowable for at least the same reasons that independent claim 1 is believed to be allowable.

The dependent claims are deemed allowable for at least the same reasons indicated above with regard to the independent claims from which they depend.

Conclusion:

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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